Asset Mapping Roadmap:
A Guide to Assessing Regional Development Resources

Prepared for US Department of Labor,
Employment and Training Administration

by the:

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I. INTRODUCTION: WHAT IS ASSET MAPPING

The U.S. Department of Labor Employment and Training Administration (ETA) has commissioned this asset mapping "roadmap" to provide guidance to regions seeking to strengthen their competitive position in the global economy. Asset mapping is a critical first step in marshalling the resources that a community can leverage to support integrated workforce and economic development initiatives.

According to *Webster's Second International Unabridged Dictionary,* an asset is "any item of value." To achieve it's economic and workforce development goals, every region has its own unique set of assets—tangible and intangible—to call upon. While these resources may or may not provide an advantage over other regions with similar goals, they do provide the foundation for actions that a region can take in realistic hopes of improving its overall competitive position.

As described below, asset mapping can be taken to different levels, depending on resources, time available, and the ambitions of a regional leadership team. At its most basic level, the asset mapping process will provide leaders with an inventory of key resources that can be incorporated into a development effort.

A more comprehensive asset mapping initiative will provide a deep understanding of the key networks and cultural attitudes that shape the regional economy, indicate "gap" areas that require further investment, and provide a baseline by which to judge future progress toward regional prosperity. Such an effort requires significant research to assess the impact of regional assets —human, financial, institutional, and natural among others—on the innovation and productivity that ultimately drive the prosperity of local citizens.

This guidebook is designed to help regional leaders understand the theory and practice of asset mapping, make a decision about what level of asset mapping is appropriate, and provide an easy-to-use guide for implementation. It has been customized for regions participating in ETA's Workforce Innovation in Regional Economic Development (WIRED) initiative.

II. VALUE OF ASSET MAPPING

As global competition for innovative firms and people increases, regional asset mapping serves a number of purposes:

- Resource Identification: Mapping allows the region's leadership to identify the resources that can be utilized to support development initiatives. Too often, visionary economic or workforce development efforts begin without a full

understanding of the regional asset base. A mismatch between strategy and assets can severely diminish the potential impact of a development initiative.

- Foundation for Strategic Planning and Implementation: Asset mapping can either lay the foundation for development of a new strategic plan or enable the realignment of existing efforts. Asset mapping helps identify gaps, redundancies and inefficiencies, and thus can help regions reallocate resources to key challenge areas and avoid needless expenditures if high quality assets already exist. The initial asset map provides a region a baseline against which to measure progress over time.

- Deepened Understanding of Key Regional Systems and Linkages: A comprehensive asset mapping process leads to a deeper understanding of the ways in which regional institutions interact with each other and with entities outside of the region. With a new perspective on well-established institutions, community leaders can more accurately assess the institutions' current value to the economy. Leaders can also identify ways in which to strengthen institutions, build linkages between them, and, ultimately, improve the regional innovation system.

- Catalyst for Partnership: Asset mapping aggregates the knowledge possessed by a few individuals and makes it available to others who may conceive of new ways to leverage the assets. A visual resource map, prepared as part of the mapping process, can help demonstrate to stakeholders that they work within a regional "community." As leaders see common interests and organizational links, they may be inspired to strengthen or form partnerships.

- Motivational Tool for Implementation: The process of creating the asset map can have a positive effect in engaging community members in a regional development effort. As described below, business surveys and in-person interviews are valuable inputs into the creation of an asset map. Engaging leaders in the analytical phase of an effort can motivate their participation in the implementation phase.

III. LEVELS OF ASSET MAPPING

Asset mapping can be implemented at three levels of analytical depth. While the greatest impact is usually gained from the most comprehensive approach, less intensive efforts are also valuable. The appropriate level of depth will depend upon the goals of the implementing organization, the available financial and human resources, and time constraints. Consideration of these factors should be undertaken in the scoping phase of the project (see discussion below).

The three levels of mapping are:

- Level 1—Asset Identification

- Level 2—Basic Evaluation
- Level 3—Comprehensive Assessment

Regardless of what level a region chooses to complete, the asset mapping process should lead to two further action-oriented steps:

- Documenting and Disseminating the Asset Map
- Launching Regional Development Initiatives

Below we describe more fully each of the levels and provide guidance on how to translate asset mapping into regional action initiatives.

Level 1 Asset Identification

As the description suggests, this phase includes the identification and cataloging of all major assets relevant to regional development. Developing this list is similar to completing a product inventory in the business world. The region needs to know what it has to work with, supplement, and "sell." At the end of this level of work, a region will have a list of the assets within its geographical borders, along with identifying information about each asset.

Process Overview: The compilation of the asset inventory should be accomplished by:

- Reviewing previous regional economic reports and profiles
- Scanning the media and other information sources for current information, and
- Obtaining input from local leaders with relevant public, private, academic and non-profit entities

The asset mapping team should review five to seven years worth of the region's previous economic studies and reports. This level of review will allow the mapping team to capture a historical perspective on asset inventories and avoid duplicative efforts. Relevant data from the previous reports and current data sources should be entered into a mapping matrix or database. Once the initial inventory is drafted, it should be circulated among a limited group of stakeholders for review, refinement and additional input.

It is possible to take the inventory to a more sophisticated level by employing GIS software to map the physical locations of assets. As discussed earlier, a spatial perspective on the region can be valuable in driving thinking about ways to link different entities. Further, even at this basic level, the mapping data will support comparisons over time to track improvement or decline.

Level 2 Basic Evaluation

The next level of mapping allows the analysts to assess the strengths and weaknesses of assets and identify gaps in their regional innovation platform. Through secondary and some primary research, the asset mapping team will be able to evaluate the significance and impact of each major type of regional asset.

Process Overview: The mapping project team should use publicly available data to obtain metrics that indicate the relative value of an asset to the region. In addition, in this stage, regional leaders should select a set of competitor regions for benchmarking. By benchmarking assets against national norms and key competitor regions, regional leaders will develop a stronger sense of key areas for improvement.

In Table I below, we provide a list of widely-available sources and tools for obtaining the kinds of data necessary to produce a comprehensive asset map. Existing comprehensive database tools, such as the *Workforce Information Toolkit System (WITS*) by New Economy Strategies and *Strategic Advantage* by EMSI, can significantly facilitate the research task. To assist asset mapping efforts, ETA has licensed WITS and is providing WIRED regions with access to underlying data, necessary training and relevant case study examples and practices.

Level 3 Comprehensive Assessment

The most comprehensive level of mapping moves beyond identification and gap analysis to provide a deeper understanding of the factors that drive the regional economy. This phase focuses on capturing three additional types of data:

- Local leadership perspectives on the value of regional assets to their operations
- The linkages between regional assets
- The underlying business culture of the local community

By evaluating the specific value of regional assets to local leaders, revealing the networks that exist to leverage those assets, and assessing regional attitudes toward risk and entrepreneurship, regional leaders will develop a strong knowledge base upon which to design or modify a development effort.

Process Overview: To capture this level of region-specific knowledge requires a significant investment. Input should be solicited from civic, business, entrepreneurial, and academic leaders, as well as investors (public, private, and philanthropic) representing major regional organizations, institutions, and companies. The process is best accomplished through a formal information gathering effort that includes: (a) the distribution of a survey and (b) interviews with the key regional stakeholders to better understand and deepen the survey findings. The survey and additional interviews seek to capture current and future utilization levels of assets, challenges and barriers to utilization, and demand for increased asset creation and investment. They also provide an opportunity to obtain a qualitative evaluation of key assets.

Once the project team has completed the information gathering associated with this level of work, the next step is to review the data for completeness and relevance to the goals of the development initiative. While difficult to forecast, it is important to consider the impact of global trends on the value of regional resources. For example, a particular industry cluster may be operating with impressive profit margins at the present time; however, research may show that global trends suggest a relocation of this industry to other countries. If this is the case, the asset assessment should note a likely diminished value of the enterprise to the region over time.

Moving Towards Action

As indicated above, all asset mapping exercises should incorporate dissemination and action initiative phases.

Documentation and Dissemination

Regardless of the level of the effort, a region should develop a communications plan for sharing asset mapping findings. Regional leaders should consider how the data will be captured, documented, and disseminated in the planning phases of the asset mapping exercise.

The most effective means of capturing all of the necessary information is in a dynamic database format. Databases will allow continual updating of information and maintain historical data for comparison. Most database software programs also provide sorting options and statistical tools that can be helpful for more detailed levels of asset mapping analysis.

In terms of the visual display, the emphasis should be on creating an information source that can be easily understood by multiple audiences. Graphically placing the assets on a geographic map of the region is often the best way of emphasizing the concentration of resources within an area. The mapping data should be useful to those who will be working on a daily basis to achieve the regional objectives and adaptable for other uses that may arise. In Appendix B, we include sample PowerPoint slide formats that can be helpful in communicating findings. Appendix C offers links to asset maps completed by a variety of regional organizations.

Dissemination of the map should be done pursuant to an outreach strategy devised by the project team. In addition to providing print versions of the asset map, leaders should consider conducting an informational campaign through regional mass media outlets, as well as the Internet. The data captured in an asset map will be useful in creating marketing materials aimed at site selectors and corporate relocation specialists.

Launching Regional Development Initiatives

The true value of an asset map will be judged by how it is utilized in a strategic fashion to advance the region's efforts to build an innovation-based economy. In some cases, the next step will be to launch a strategic planning process. In other cases, where a development plan is underway, the next step will be to revise the existing strategy to reflect any "gaps" discovered through the mapping. The key point is that asset mapping is not an academic exercise—it is a foundational effort that can significantly enhance a region's development efforts.

At its most powerful, asset mapping is about understanding the relationship between assets. A fully-executed asset map will enable decision-makers, for example, to know whether a large medical facility located in the region has a well-developed set of relationships with researchers at area universities, or whether such connections will need to be made in order for to support an emerging biomedical cluster. Mapping is intended to promote connections or relationships between individuals, between individuals and organizations, and between organizations.

In sum, the asset mapping process is a means of assessing available regional assets that will indicate ways to better link and strengthen these assets in order to support an effective innovation-based economic development strategy.

IV. ORGANIZING THE MAPPING PROCESS

Because regions will find themselves at different stages of building their innovation-based regional economy, it is not possible to prescribe a single routine for asset mapping. However, below we offer a suggested process for the implementation of a comprehensive asset mapping.

Assemble the Project Team –The asset mapping project will require a core team of dedicated individuals. Involvement should be sought from organizations/individuals that could be involved in the action initiatives that will emerge based on the asset mapping. In addition, a region may want to engage an outside contractor with asset mapping experience to supplement the efforts of regional participants.

The composition of the team should include individuals with knowledge of the general asset classes that will be mapped. Ideally, the team will include representatives of the private, academic, public and non-profit sectors, and, more specifically, individuals with knowledge of the workforce, educational and economic development institutions in the region. In addition, it will be important to have one or more individuals with research and analytical skills, and familiarity with creating and managing data bases. Interviewing, writing, and public speaking skills will also be valuable to the team to assist with research and communication tasks.

For larger scale projects, it will be valuable to create a steering committee of respected community leaders who can give guidance on the subject matter and use their convening

power to build local support for the effort. A template and checklist to help guide project team creation is included on the WIRED Collaborative web space.

Project Scoping and Goal Setting – As the project team gets organized, it must address some fundamental questions before commencement of any work. This is critical to ensure that members of the team are approaching the project with shared goals and expectations. The significance of this stage of work cannot be overstated—it will impact everything from the from the data collection plan to the ultimate implementation strategies.

As an initial matter, the "region" must be defined—in some cases, there may be a clear delineation of a region, based on geography, history, or similar factors. In other cases, it will be a function of cooperation between different jurisdictions that may not have previously worked together for economic or workforce development purposes

Key questions the project team must address are:

- What are the learning objectives for the asset mapping process?
- What level of asset mapping should be undertaken?
- What are the resources available for accomplishing the asset mapping?
- Which stakeholders need to be consulted at the various levels of work?
- To whom and how should the asset map be disseminated?

The scoping phase should lead to a development of an implementation plan that identifies key roles and responsibilities and contemplates a process of ongoing dissemination and updating of map information.

Mapping Implementation: The time and resource commitment required to produce a usable asset map is dependent on the quality and quantity of resources assigned to the project. In most cases, it is reasonable to expect twelve to fourteen weeks of dedicated effort by the project team to complete a three-level mapping exercise.

The upfront work—creation of the project team, scoping and goal-setting, and performance of Level 1 work -- can be completed in 3 to 4 weeks. This includes time for obtaining review of and feedback on the inventory list from stakeholders outside the project team.

Level 2 analysis can be completed by the project team itself or in conjunction with outside contractors. The length of this task will vary depending on the number of individuals assigned to the task, the resources provided, and how much effort beyond accessing public data sources is required. In general, this can be finished in approximately two to three weeks.

Level 3 evaluation can greatly vary in scope of effort. For example, if the project team decides that additional input-gathering will help build support for the overall regional initiative, it may decide to conduct a greater number of interviews or meetings. Scheduling and holding these meetings can extend the completion date. Generally, three to four weeks

should be sufficient for the compilation of the necessary data if appropriate planning is undertaken.

Evaluation of the data—either by the project team alone or in combination with outside contractors—can take another two to three weeks. The net result of the evaluation may be a determination that more or better data is needed, in which case individuals should be delegated to fill the information gaps. A template and checklist to help guide project scoping and implementation is included on the WIRED Collaborative web space.

Dissemination: Once the data has been properly evaluated, the final stage is the creation and dissemination of the asset map. Regardless of what form it takes, this task should be assigned to a subset of the project team to facilitate efficient delivery of the results. Once the map has been created, the draft should be circulated to the remainder of the project team and, perhaps, the larger advisory board, for review and comment. The process of creating the draft map and then finalizing it can require an additional three weeks of work, as it is desirable to have a number of stakeholders review it for accuracy and impact.

Dissemination can occur through a number of means. Among them:

- Development and distribution of print collateral
- Publication through mass media, such as newspapers
- Presentation at public forums
- Posting on a website
- Direct mailings to key stakeholders and/or a wider audience

A representative timeline for a comprehensive asset mapping process appears below.

Table IV: Representative Timeline for Asset Mapping

Weeks 1-4	Weeks 5-7	Weeks 8-13	Weeks 14-16	Ongoing
• Creation of Project Team • Project Scoping and Goal Setting • Completion of Level 1 Identification (including feedback from stakeholders external to project team)	• Level 2: Basic Evaluation • Data collection • Interviews	• Level 3: Comprehensive Assessment • Additional Interviews • Business Survey • Evaluation and synthesis of Level 2 and 3 research	• Documenting the Asset Map • Circulating for Review by Stakeholders	• Dissemination of Asset Map • Periodic Updating of Asset Map • Launch Action Initiatives

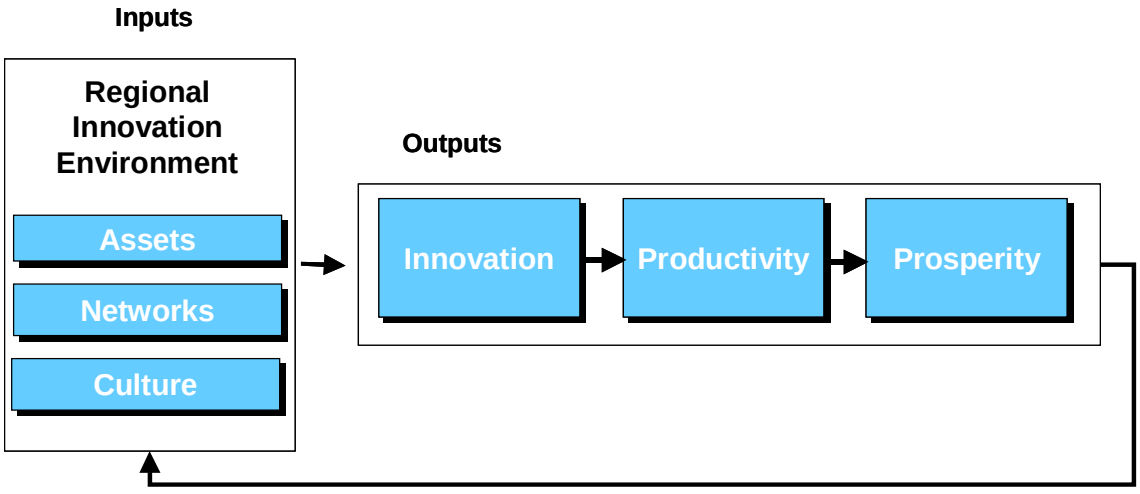
V. WHAT GETS MAPPED?

The mapping endeavor includes both the inputs and outputs of the regional innovation-based economy.

Inputs to Innovation Capacity

Successful innovation, and the increased productivity and prosperity that results, is the output of the dynamic interplay of a variety of regional factors. Every region has a different set of assets, networks, and an underlying economic culture, that together, determine its success in supporting innovative firms and people. As shown in Figure II, these innovation inputs form the regional innovation environment that impacts the ultimate prosperity of the region.

Figure II:
Regional Innovation Environment Inputs and Outputs



Each input in the innovation-based model affects a region's capacity for supporting innovation in different ways. The following sections describe how assets, networks, and culture can positively or negatively impact a region's innovation platform. Specific elements recommended for inclusion in the mapping exercise are provided.

Input Metrics

Assets

Assets in the innovation-based economic development model include the human, intellectual, financial, physical and institutional capital resident in a region. The asset base incorporates many common criteria for corporate location decisions, such as availability of skilled labor, the quality of transportation infrastructure, cost of doing business, and

proximity to customers. Assets also include many other factors that are not as widely measured, but are important to innovation. These include research and development investment, technology transfer, and entrepreneurship support programs.

The major types of assets that should be included in the mapping exercise are listed below.

- Human Capital
- Research and Development Institutions
- Financial Capital
- Industrial Base
- Connective Organizations
- Legal and Regulatory Environment
- Physical Infrastructure
- Quality of Life

Table I outlines the detailed asset types and specific metrics that can be incorporated in the asset assessment and Appendix A provides a fuller explanation of the importance of each asset class.

Networks

Having numerous and even high quality regional assets is not sufficient to drive growth. Assets must be linked to support regional innovation-based growth. All too often however, innovative ideas and people remain unconnected. For example, many ideas generated by university researchers, while valuable from a purely intellectual standpoint, do not reach their full potential in terms of economic development because they are not translated into new products or services.

Among the most effective strategies for creating networks is forming a collaborative economic development partnership involving leaders from business, education, government, and non-profits. Other examples of networks that can build innovation capacity include angel capital networks, research partnerships between universities and businesses, and workforce development programs that encourage companies, colleges, and secondary schools to work together to raise the next generation of skilled workers. Further, while difficult to measure, getting a sense of the informal networks that form within regions around institutions, such as university alumni associations, is also worthwhile, as these informal ties often are as important as formal ones in facilitating knowledge transfer.

Understanding the formal and informal linkages between regional assets – and the organizations that promote such linkages – is a key aspect of developing a comprehensive perspective on the regional economic platform.

Culture

A final aspect of a comprehensive regional assessment is understanding the underlying attitudes toward business in a region. The availability of strong regional assets and knowledge networks helps innovators identify new ideas and new partners. A supportive business culture can lead to stronger networks and a willingness to invest in regional innovation assets.

One key aspect of a regional business culture is the degree to which business leaders are willing to collaborate and share ideas even when they compete in some circumstances. For regions to get ahead of the innovation curve, local leaders must be willing to share insights. Another key area to evaluate is regional attitudes toward risk. If entrepreneurship is to take hold, risk taking must be appreciated and celebrated.

A final cultural area to assess is regional appreciation of people from diverse experiences and backgrounds. Since innovators, by their very nature, are often different from the norm, regions where the populations respect and embrace difference may have an easier time cultivating innovators.

Output Measures

The input measures in an asset mapping are useful descriptors of the regional business environment. However, it is critical to remember that the ultimate goal of economic development is not high research rankings, new business creation, or even jobs – it is to increase the prosperity of the regional citizenry. Therefore key outcome measures should be tracked. Following the framework provided above, there are three outcome areas to be assessed.

Prosperity

At the end of the day, the ultimate evaluation of economic development initiatives should be whether the people impacted have a higher standard of living. While the concept of prosperity includes a number of subjective parameters (e.g., personal happiness), it can be quantified through financial metrics such as per capita income, median household income and poverty levels.

Productivity

Regional residents' standard of living is determined by the productivity of the regional economy. Productivity is a measure of the value of goods and services produced per unit of labor and capital employed in creating the good. Put simply, it measures output per unit of

input. The level of productivity sets the wages that can be sustained and the returns earned by investors, which are the two principal components of a region's per capita income.

Innovation

Productivity today sets current competitiveness, but growing a region's standard of living requires the steady growth of productivity. A high level of productivity itself is not enough when developing countries and regions are improving their skills, and can rapidly access modern technology. Advanced regions need to continually innovate to be able to produce products and services that lower wage regions cannot yet offer, and to maintain the productivity advantage that supports their higher wages.

Table I: Detailed Asset Inventory and Evaluation Criteria

In the following table, we offer a comprehensive list of the assets that may be present in a region and suggest criteria for evaluating the assets through Level 3 of the mapping process. For each type of asset, regional leaders should consider three types of evaluation: comparisons to previous years within the same region; benchmarking publicly available data against competitor regions; and capturing the satisfaction of the local business community via a survey. As some of the assets indicated will be hard to identify or evaluate, the mapping team will need to assess what level of data capture and evaluation is appropriate for their regional effort.

Human Capital

K-12 Education Systems

Data	Evaluation Criteria
Number, names and location of school districts	National Test Scores (NAEP scores)
Names of school district leaders and contact info	Graduation Rates
Number, names and location of schools	SAT/ACT Scores
Names of principals and contact information	State standardized test scores
Number of students (including English as Second Language students)	Enrollment projections
Special programs, such as internships and advanced placement for high school students	Articulation agreements with community colleges
	Programs for high school students to take classes at or with higher ed institutions

	Number of students in internship programs placing them in workplaces
	Business community satisfaction with quality of K-12 education/graduates

Community Colleges

Data	Evaluation Criteria
Number, names and locations	Job placement information for graduates
Names of officers and contact information	Grants received for workforce development
Number of students, with breakdown by relevant categories (such as full/part time)	Articulation agreements with regional 4-year colleges
List of academic areas/programs relevant to regional initiatives (with enrollments)	Business community satisfaction with general quality of education and with customized training offerings
List of specialized programs and faculty	
Collaborations with business community and with regional K-12 schools	
Number of annual graduates	

Four Year Colleges and Universities

Data	Evaluation Criteria
Names and locations of each institution	Rankings by relevant arbiters of quality and popularity (e.g., US News and World Report Rankings)
Contact information for relevant officials, such as President, Deans, etc.	Retention rate of graduates in region
Total enrollments and enrollments in undergrad and graduate degree programs relevant to regional economic initiatives	History of funding for areas of study/research relevant to regional industry
List of specialized programs and faculty	Annual number of math/science graduates
List of special purpose facilities	Endowment Size
Relevant research programs	Transactions involving technology transfer (Licensing, Spin-Outs, Sales)
Collaborations with regional business community and other institutions that support regional growth	Amount of technical assistance offered to region's businesses

Number of international students and programs	Placements in businesses through apprenticeship/internship programs
Number of online courses offered	Business community satisfaction with quality of education, employability of graduates, and private-academic collaboration

Private/Not-for-Profit Technical Schools and Institutes

Data	Evaluation Criteria
Names, location, and contact info for relevant officials	Annual number of graduates and graduation rates
Areas of specialization	Retention rates of graduates in region
List of programs	Rankings by relevant ranking service
Affiliations with other area institutions	Business community satisfaction with quality of education, employability of graduates, and ease of interaction
Eligibility requirements	
Total enrollments and enrollment in relevant programs	

Continuing and Professional Education Providers

Data	Evaluation Criteria
Name, location and contact information for relevant officials	Number of certificates awarded in programs relevant to regional industry workforce needs
Nature of institution (e.g. four year college)	Business community satisfaction with quality of education, employability of graduates, and ease of interaction
List of certificates and programs offered	
Affiliations with other regional institutions	

Available Workforce

Data	Evaluation Criteria
Breakdown of regional population by age bands, including number of adults over 18 years of age	Educational attainment levels (versus other regions)
Location of population within region	Number of adults with multilingual capabilities
Breakdown of regional population by income levels	Business satisfaction with quality and availability of workers, generally
Breakdown of regional population by occupation	Comparisons of availability to other regions

	Registered job seekers with applicable state and local agencies

Specialized Workforce

Data	Evaluation Criteria
Number of skilled workers in areas of employment relevant to innovation-based economy	Business satisfaction with quality and availability of skilled labor in their industry
	Comparisons of availability to other regions
Future skill needs for industries that are growing or targeted for growth	Comparisons of skilled labor types to other regions (managers, scientists, engineers, and technicians)
	Alignment of workforce with industry needs (projected occupational growth categories for workforce compared with current workforce occupational mix)

Workforce System

Data	Evaluation Criteria
Name and location of workforce one-stop service centers	Number of regional residents served by relevant agencies
Names of programs/services offered by government agencies	Time it takes to fill key jobs in target industries
Not-for-profit organizations offering programs in, or making investments in, workforce development	Dollar value of workforce development investments in region
Private sector programs for workforce development	Budgets for workforce agencies
Remediation programs for displaced workers	Outcomes of workforce development programs, e.g. job advancement or job placements
Career advancement programs for incumbent workers	Alignment of programs with industry needs
	Integration of programs across educational institutions
	Alignment of workforce system with economic development and educational systems
	Planned increases or decreases in funding

Research and Development

Research Centers

Data	Evaluation Criteria
Name, address and contact information	Overall budget (and portion dedicated to work likely to be of use to regional industry)
Type of institution (public, private, academic, mixed)	Number of patents held
Names of officers	Patenting Rates (Patents/ Research Dollar)
Areas of research focus	Transactions involving technology transfer (Licensing, Spin-Outs, Sales)
	Government grants received, over time
	Notable inventions/research studies (Awards
	Business sector satisfaction with level of interaction

Business Incubators

Data	Evaluation Criteria
Name, address and contact information	Success rate of incubation (Percent of companies that survive after five years)
Mission and any specialized focus for incubator	Number of jobs created by graduate from the incubator, average wages of those jobs
Names of companies located in incubator, with contact information and area of focus for each	Successful collaboration with other regional entities

Research Parks

Data	Evaluation Criteria
Name, address and contact information	Occupancy rates
Available space for lease or building	Sponsored networking activities
Specialized focus of research, if any	Successful collaboration with other regional entities

Corporate Research and Development

Data	Evaluation Criteria
Names, addresses and contact information for companies with significant Research and Development activities	Patenting Rates (Patents/ Research Dollar) and number
Areas of Research and Development activities	Notable inventions/ research studies
Relationships with other regional institutions	Successful collaboration with other regional entities
Overall budget	Spin-outs and major licensing deals

Financial Capital

Venture Capital Firms

Data	Evaluation Criteria
Name and location of firm and contact information for principals	Amount of assets invested in region (number of deals and total dollar amounts)
Size (amount of capital under management) of existing firms	Return on investment
Targeted sectors	Co-investments with other regional investors
	Strength of relationship with firms outside of region (bringing in non-regional investment to regional deals)

Angel Investors/Networks

Data	Evaluation Criteria
Name and contact information for individual/network principal	Amount of assets invested in region (number of deals and total dollar amounts)
Size (amount of capital under management) of existing angel groups	Return on investment
Targeted sectors	Co-investments with other regional investors
	Strength of relationship with firms outside of region (bringing in non-regional investment to regional deals)

Commercial Banks

Data	Evaluation Criteria
Name and locations(s) of bank regional headquarters and contact information	Amount of loans outstanding to regional businesses
Names of bank presidents	Relationships with region's businesses
Special investment programs	Relationships with other financial institutions inside and outside the region

Philanthropic Foundations (National and Regional)

Data	Evaluation Criteria
Name, address and primary points of contact	Assets and other financial data
Background/ history	Record of grants made, especially within region
Geographic focus and limitations on giving	
Fields of interest	

Government programs

Data	Evaluation Criteria
SBA Loans	Amount of SBA loans in region
SBIR Support Programs	Amount of SBIR Contracts

Industrial Base

Major Employers

Data	Evaluation Criteria
List of largest employers in region	Position versus international competitors in their industry
Names, location, and contact information for officers	Growth plans of individual firms
Applicable industrial codes	Successful collaboration with other regional entities
Number of employees	Number of Registered ISO companies
Product and service offerings	Business satisfaction survey cut by cluster to determine key gaps or needs for firm development

Clusters

Data	Evaluation Criteria
Identify clusters in the economy	Growth rate of employees, firms, concentraion
Number of firms in clusters	Benchmark clusters against others outside the region in terms of size, concentration, innovation output (patenting)
Number of employees in clusters	Business satisfaction survey cut by cluster to determine key gaps or needs for cluster development
Cluster support structure	Business satisfaction with related and supporting services (law, banking,

	consulting etc.)

Small Businesses/Entrepreneurship

Data	Evaluation Criteria
List of successful entrepreneurial firms	Rate of firm birth and firm death (versus competitor regions) Net Business Creation Rates
Name and location of entrepreneurship and small business support centers/ programs	Amount of VC and Angel funding received by regionally-based firms
	Business satisfaction with entrepreneurial support organizations/training

Connective Organizations

Business organizations (e.g. Chamber of Commerce)

Data	Evaluation Criteria
Name of organization and contact information for professional and volunteer officials	Size of membership
Names of member organizations	Budget
Major program areas	Alignment of programs to key regional business/economic development needs

Business/Education Partnerships

Data	Evaluation Criteria
Name of partnership and contact information for leaders	Size of membership
Mission of partnership	Budget
Major program areas	Alignment of programs to key regional business/economic development needs

Industry Associations

Data	Evaluation Criteria
Name and contact information for officials	Budget
Names and contact information for member organizations	Size of membership
Major program areas	Alignment of programs to key regional business/economic development needs

Legal and Regulatory Environment

Taxes

Data	Evaluation Criteria

Federal, state, local, and regional tax rates potentially impacting regional businesses	Effective tax rates for region (vs. competitor regions)
Available tax credits/tax incentive programs	Amount provided in tax incentive programs
	Overall business satisfaction with business environment (via survey)
	Scores on Ease of Doing Business indices

Wage Structure

Data	Evaluation Criteria
Breakdown of region's skilled worker categories	Wage rates for relevant skilled labor categories in region and competitor regions

Utilities

Data	Evaluation Criteria
Name, contact information, and service areas for major suppliers of water, gas, electricity	Average gas, electric, and water rates in region (vs. competitor regions)

Local Government

Data	Evaluation Criteria
Name and contact information for local officeholders	Amount of funding for relevant activities Satisfaction with government services and programs
Nature of relationship to/jurisdiction over regional assets	
Key development-related programs	

State Government

Data	Evaluation Criteria
Name and contact information for state officeholders	Amount of funding for relevant activities Satisfaction with government services and programs
Nature of relationship to /jurisdiction over regional assets	
Key development-related programs	

Federal Government

Data	Evaluation Criteria
Name and contact information for elected officials representing region	Amount of funding for relevant activities Satisfaction with government services and programs
Name and contact information for relevant federal officials in regional offices	

Nature of relationship to/jurisdiction over regional assets	
Key development-related programs	

Legislation/Laws

Data	Evaluation Criteria
Pending legislation impacting on assets of/plans for the region	Financial impacts
Existing statutes/regulations, on state/local/regional levels that provide competitive advantage over other regions and/or support other regional assets	Similar legislation/law in other competitor regions

Physical Infrastructure

Airports

Data Points	Evaluation Criteria
Name and location	Current passenger and cargo traffic and projections
Number of carriers	Growth plans
Number of flights	
Destination cities	
Cargo handling capacity	

Highways

Data	Evaluation Criteria
Names of major highways	Average commute times
Miles of interstate roads	Driving distance to other major metro areas
Number of interstate interchanges	

Rail and Trucking

Data	Evaluation Criteria
Existence of regional and interstate passenger service	Frequency of service and destination cities
Existence of cargo service	Performance records. E.g. on time history
Location of intermodal facilities	
Name and contact information for interstate trucking firms with operations in region	

Maritime

Data	Evaluation Criteria
Name of port facilities and contact information for officers	Tonnage handled at port on annual basis
Name of shipping lines using facility	
Nature of cargo handled	

Communications

Data	Evaluation Criteria
Name and contact information for telecomm providers in region	Availability of high-speed Internet access
	Capacity of networks
	Plans for expansion

Natural Resources

Data	Evaluation Criteria
Available water supply and infrastructure for delivery	Quantification of relevant resources
Available resources to support business clusters and infrastructure for delivery	

Land and Real Property

Data	Evaluation Criteria
Available land for building	Average purchase price/square foot
Available buildings for occupancy	Average rental cost/square foot
Projects online	Vacancy rates

Industrial/Business Parks

Data	Evaluation Criteria
Name, location, and contact information for management	Average purchase price/square foot Average rental cost/square foot Vacancy rates
Special features	

Mass media channels, such as television, radio, and newspaper

Data	Evaluation Criteria
List of mass media channels and contact information	Circulation figures/Nielsen ratings/Arbitron ratings
	Programming/reporting that supports development efforts
	Involvement in regional initiatives

Quality of Life

Amenities and Population Flow

Data	Evaluation Criteria
Parks and recreational facilities	Cost of Living indices

Cultural attractions and institutions (museums, theater, music, etc.)	Quality of Life indices
Inflow/Outflow of residents, by age and education	Net migration rate by age and education level

VI. INFORMATION SOURCES FOR MAPPING

Information for asset mapping is gathered from five primary sources: **existing knowledge of project participants, previous regional reports, public data, surveys, and interviews.** These last three sources are particularly relevant to comprehensive asset mapping projects.

The asset mapping team needs to be creative in using resources available to them and in determining if there are additional region-specific metrics that should be included.

Table II: Suggested Data Collection Approaches by Mapping Level

Level of Asset Mapping	Data Collection Approach
Level 1--Identification	• Review of basic public data • Report gathering and review • Input from regional team members and regional partners
Level 2 -- Basic Evaluation	• Data sources in Level I • Public data sources/databases • Interviews
Level 3 -- Comprehensive Assessment	• Data sources in Level I and II • Regional business survey • Additional Interviews

Public Data and Historical Reports

There are a variety of public data sources that can offer data on regional innovation assets, most of which are available at little or no cost. Among the public data sources, some capture multiple data elements and can play an important role in Level 2 work. Among these are www.census.gov, www.workforce3one.org, and Economy.com.

It is important to note that local data sources may be available for information specifically pertinent to the performance of local institutions – and such information may have already been captured in other reports. At other times, the project team may have to extract whatever meaningful data it can from state, county or other data that encompasses geographic areas not identical to the region. Although precision in data is a worthwhile goal, there will be occasions when the project team may decide to use imperfect data in order to have some means of evaluating an entity identified as a regional asset.

The Workforce Innovation and Technical Solution (WITS) database will be a helpful tool to WIRED regions. Currently licensed by ETA for the use of 13 regions that have received WIRED grants, it is a web-based software solution that combines datasets with GIS mapping capabilities to aid economic development and workforce-related decisions. It aggregates data on historic and current characteristics of a regional economy, including industry sector and cluster information, labor pool and labor market data, and detailed information on the

businesses resident in a region, among other things. Appendix D contains a full description of WITS data elements and use of the database in supporting asset mapping.

Regional Business Survey

To supplement the publicly available data collected during Level 2, conducting a concise business survey is a critical element of the qualitative research of Level 3. Since choices made by private sector firms ultimately drive regional economies, the survey should be targeted exclusively to private sector respondents who report their actual knowledge. The survey should ideally elicit information from executives about their perceptions of the regional business platform (regional assets), their participation in regional business organizations and links to other regional institutions (networks), and their attitudes toward business and the region (culture).

Below in Appendix E, we include a sample business survey created by the Council on Competitiveness that has been utilized effectively in numerous regions.

Community Leadership Interviews

To deepen understanding of the regional assets as part of the qualitative research in Level 3, interviews should be conducted with a wide variety of community leaders including: government officials, university leaders, venture capitalists and other financiers, business service providers and advisors, business associations, economic developers, and non-profit community groups. Approximately 25-30 interviews will usually be sufficient; however, more may be needed for larger regions or more comprehensive efforts.

The interviews with stakeholders in the region serve at least three key functions:

- To ensure identification of the major organizations that serve as regional assets
- To identify key alliances and networks that support and promote regional innovation, and to learn how they work
- To properly value the regional assets identified

Even though community leadership interviews are likely to be most useful in Level 3, a region may decide to engage in a small number of these as part of Level 2 analysis to obtain certain data that may not otherwise be available from other sources. A sample interview guide is included in Appendix F.

In addition, a region may want to consider engaging in a specific network mapping exercise that allows for graphic representations of existing connections between assets. This can suggest areas in which stronger connections need to be made. Complex human system analysis, making use of software developed for purposes other than economic or workforce development, can be used effectively. Resources can be found, for a fee, at websites like www.networkweaving.com and www.orgnet.com.

Table III provides suggested public sources for key data elements identified in Table I, and identifies which data points are available in WITS.

Table III: Data Sources for Asset Evaluation
Input and Output Metrics

HUMAN CAPITAL			
EVALUATION AREAS	**DATA SOURCE**	**IN WITS**	**WEBSITE**
K-12 Education Systems	Standardized test scores--National Assessment of Educational Progress (NAEP)/National Center for Education Statistics		www.nces.ed.gov
	SAT/ACT Scores—College Board and ETS		www.collegeboard.com and www.ets.org
	Graduation rates--State Department of Education website		
Community Colleges and Technical Schools	Higher Education Directory (published by Higher Education Publications, Inc.)		(http://www.ccweek.com/news/templates/template.aspx?articleid=13&zoneid=1
4 Year Colleges and Universities	US News and World Report rankings		www.usnews.com
	Business Week rankings of specific disciplines		www.businessweek.com/bschools/
	The Wall Street Journal rankings of specific disciplines		www.wsj.com
	PhD graduates		http://caspar.nsf.gov
	Endowments—Chronicle of Higher Education		http://chronicle.com
	National Association of College and University Business Officers		http://www.nacubo.org

HUMAN CAPITAL			
EVALUATION AREAS	**DATA SOURCE**	**IN WITS**	**WEBSITE**
Available Workforce/ Occupational Analysis	Educational attainment—US Census Bureau Summary File 3		http://factfinder.census.gov
	Managers, Engineers, Scientists, and Technicians – US Bureau of Labor Statistics Occupational Employment Survey	X	http://www.bls.gov/oes/
Worker Productivity	Economy.com		www.economy.com
Job Growth	Bureau of Labor Statistics		www.bls.gov/sae
Workforce and training programs	Various sources	X	
Wage Data	Bureau of Labor Statistics		www.bls.gov/cew
	Bureau of Economic Analysis		www.bea.doc.gov/bea/regional/reis
Payroll by Cluster	Kleinhenz & Associates; Economy.com	X	www.economy.com

RESEARCH AND DEVELOPMENT			
EVALUATION AREAS	**DATA SOURCE**	**IN WITS**	**WEBSITE**
University Spending	NSF WebCASPAR database		http://vaspar.nsf.gov
Federal R&D Expenditures	RAND Radius database	X	
Private R&D	Schonfeld & Associates	X	

Patents	US Patent and Trademark Office database of issued patents		http://patft.uspto.gov
Patent analysis and scorecards	1790 Analytics; US Patent and Trademark Office	X	http://patft.uspto.gov
University Tech Transfer Activity	The Chronicle of Higher Education University Tech Transfer Scorecard		http://chronicle.com/stats/techtransfer
	Association of University Technology Managers survey		www.autm.net
Small Business innovation Research Grants and Technology Transfer grants	Local SBA office		www.sba.gov
	Specific information about these types of grants		www.sba.gov/sbir/indexsbir-sttr.html

FINANCIAL CAPITAL			
EVALUATION AREAS	**DATA SOURCE**	**IN WITS**	**WEBSITE**
Venture Capital	PWC/Venture Economics/NVCA Moneytree Survey ; Thompson Financial	X	www.ventureeconomics.com/vec/statshome
Information about angel networks/VC firms	Local print media, such as business newspapers published by American Business Journals		www.bizjournals.com
Foundation Giving and Financial Data	The Foundation Center and its online database		www.foundationcenter.org and http://fconline.fdncenter.org
Commercial Bank assets and lending	Public filings with government agencies		www.sec.gov
Government Programs	Small Business Administration re direct and guaranteed		www.sba.gov

	loans by region		

LEGAL AND REGULATORY ENVIRONMENT			
EVALUATION AREAS	**DATA SOURCE**	**IN WITS**	**WEBSITE**
Tax Burdens	Economy.com;		www.economy.com
	The Tax Foundation		www.taxfoundation.org
Business Costs	Precis Metro Reports		www.economy.com
	Forbes rankings		www.forbes.com/lists
Government Programs	Websites of relevant government entities		

INDUSTRIAL BASE			
EVALUATION AREAS	**DATA SOURCE**	**IN WITS**	**WEBSITE**
Clusters	The Institute of Strategy and Competitiveness Cluster Mapping project		www.data.isc.hbs.edu/isc/index.jsp
Patents in Traded Clusters	The Institute of Strategy and Competitiveness Cluster Mapping project		www.data.isc.hbs.edu/isc/index.jsp
Cluster employment, location quotient	Kleinhenz & Associates	X	www.Economy.com

New Firm Starts	US SBA Office of Advocacy website		www.sba.gov/advo/research

PHYSICAL INFRASTRUCTURE			
EVALUATION AREAS	**DATA SOURCE**	**IN WITS**	**WEBSITE**
Highways	Commuting Data—TTI's annual Urban Mobility Study		www.mobility.tamu.edu/ums/congestion_data
Telecommunications	Progressive Policy Institute; specific regional telecomm providers		www.neweconomy.org
Airports	Federal Aviation Administration		http://www.faa.gov/airports_airtraffic/
Maritime	Regional and State Government; Port Authorities		
Rail and Trucking	Regional and State Government; Rail and Trucking Companies		

QUALITY OF LIFE			
EVALUATION AREAS	**DATA SOURCE**	**IN WITS**	**WEBSITE**
Quality of Life	Money Magazine Best Places to Live Report		http://money.cnn.com/magazines/moneymag/
Cost of Living	ACCRA Cost of Living Index		www.coli.org

Migration Data	Economy.com /Precis Metro Reports	X	www.economy.com www.census.gov/prod/2003pubs/censr-12.pdf

OUTPUT METRICS

EVALUATION AREAS	DATA SOURCE	WEBSITE
Idea Generation		
Patents	U.S. Patent and Trademark Office	**http://patft.uspto.gov**
Idea Development		
University Tech Transfer	Association of University Technical Managers	**www.autm.net**
Tech Transfer Scorecard	Chronicle of Higher Education	**http://chronicle.com/stats/techtransfer**
New Firm Starts	Small Business Administration	**www.sba.gov/advo/research**
SBIR Grants	Small Business Administration	**www.sba.gov/sbir/indexsbir-sttr.html**
Commercialization Metrics		
Gazelle Companies	Progressive Police Institute	**www.neweconomyindex.org/ states/2002/03_dynamism_02.html**
Inc 500 Companies	Inc Magazine	**www.inc.com/inc500**
Productivity Metrics		
Gross Regional Product	Economy.com	**www.economy.com**
Prosperity Metrics		
Job Growth	Bureau of Labor Statistics	**www.bls.gov/sae**
Unemployment Rate	Bureau of Labor Statistics	**www.bls.gov/lau**
Average Wage	Bureau of Labor Statistics	**www.bls.gov/cew**
Average Wage	Bureau of Economic Analysis	**www.bea.doc.goc/bea/regional/data/htm**
Per Capita Income	Bureau of Economic Analysis	**www.bea.doc.goc/bea/regional/data/htm**
Median Household Income	Census Bureau, American FactFinder	**http://factfinder.census.gov**
Poverty Rate	**Census Bureau, American FactFinder**	**http://factfinder.census.gov**

In Appendix A, we provide a more detailed explanation of the data metrics and sources.

VIII. APPENDICES

Appendix A: Detailed Explanation of Metrics and Sources

Explanation of Asset Classes

Human Capital

Talented people generate the new ideas and product enhancements that drive innovation. As the economic development field adapts to meet the needs of an evolving international economy, regions are increasingly touting their strengths in skilled labor to attract and retain innovative companies. In fact, most studies of corporate location decisions have shown that skilled workforce is such an important asset that many regions have made it the central theme of their regional marketing efforts. Innovative companies choose regions with a reliable and flexible supply of local talent. Further, firms tend to expand in regions in which they can find a core of workers with specialized skills related directly to their industry.

Regions cannot develop skilled workforces without investment in the institutions that create and nurture talent, such as universities, colleges, and the K-12 education system. Staying competitive in the modern global economy increasingly requires a greater capacity for life-long learning and skill adaptation. Research universities, such as those located in talent hubs like the Bay Area in California and Boston, MA, are key assets for building and maintaining human capital. However, for regions without major research universities, steps can still be taken to ensure that companies and employees have access to education and training programs that provide the opportunities for life-long learning and skill development. Economic developers must account for all three factors—available workforce, specialized or skilled workforce, and quality of educational institutions—when analyzing their regional capacity for innovation.

Merely having the presence of certain institutions is not sufficient to ensure regional capacity. It is also necessary to ensure necessary levels of investment in human capital development by public, private, and not-for-profit entities in the workforce system. Critical as well is proper integration of the education, workforce development, and economic development systems.

Research and Development Institutions

Research and development (R&D) adds to the knowledge base of a region and is essential to long-term economic growth. R&D spending at universities creates opportunities for partnerships between education and industry that can significantly benefit retention of companies and talented students. R&D investment by firms and government is also critical for developing innovative new products and services that can drive regional wealth creation and prosperity. Research parks and business incubators, when properly developed and

managed, can provide the institutional infrastructure to link business and university researchers and support firm-to-firm R&D partnerships.

Financial Capital

Access to capital is a vital asset for supporting entrepreneurship and innovation. Transforming ideas into commercial products and services requires significant resources, and few entrepreneurs in the U.S. can finance the entire development cycle alone. Regions such as Silicon Valley have little trouble retaining entrepreneurs and start-up firms because of the significant presence of venture capital (VC) firms. Other regions, which have a more difficulty attracting the attention of VC firms located outside the area, must find different solutions for providing access to capital for entrepreneurs, such as organizing angel groups and other joint-investment programs to leverage sources of family-based wealth.

Industrial Base

Understanding a region's industrial base is an essential step for crafting an effective economic development strategy. Economic development professionals need to have sound understanding of the key employers in a region, including product and service offerings, business models, and bases for competitive advantage. Since it is very difficult to build an industry from scratch, regions are best served by first trying to build from areas of traditional strength. Cluster analysis can identify regional strengths and weaknesses that do not necessarily come to light using the conventional wisdom of how regional industries are structured.

Physical Infrastructure

A region's physical infrastructure is an important condition for supporting regional innovation. Transportation and communications infrastructures in the U.S. are relatively developed, but without the telecommunications networks, roads, and other public utilities in place, regions have little chance of supporting and growing innovative industries. The availability of high-speed Internet access, for example, is a key asset for attracting most modern companies and entrepreneurs. For rural areas, having this link has become a critical factor in their ability to attract workers who wish to telecommute. Transportation factors, such as the average commute time, can also figure prominently in a region's capacity to attract and retain companies and talent. For some industries, natural resources, particularly access to water, can play a primary role in impacting expansion decisions.

Legal and Regulatory Environment

The legal and regulatory environment plays an important role in the success of innovation-based economic development. The relative importance of taxes and regulations among other regional factors, such as availability of skilled workforce, is frequently overstated.

Nevertheless, regional tax and regulatory burdens—real or perceived—can affect the location and resource allocation decisions of companies and should be accounted for in regional economic analysis.

Quality of Life

Perceptions about quality of life in a region can heavily impact attraction and retention efforts of companies, skilled workers, and entrepreneurs. Talent is mobile, and quality of life has assumed greater importance in economic development practices as many regions have developed strategies to nurture the "creative class".

Quality of life is a subjective metric; people have differing opinions on what constitutes a "quality". Basic, standardized measures of quality of life are well known and include cost of living, commuting times, and crime rates. However, the quality of life factors that can define a region are not as predictable. Portland, Oregon is well known for its environmentally sensitive planning and "walk ability". In New York City, residents love the urban environment and proximity to arts and cultural amenities. Many citizens of Dallas, TX point to the Dallas Cowboys and the region's other major professional sports teams as an important quality of life factor.

Not all characteristics of a region that are mentioned under the umbrella term "quality of life" are equally beneficial in terms of supporting innovation. Professional sports teams, for example, are great assets for promoting tourism and entertainment. However, their contributions to enhancing a region's capacity for innovation are minimal. Economic developers must account for the various (and often competing) ideas about quality of life in a region and develop strategies that promote innovation and appeal to a citizenry's tastes and preferences.

Detailed Sourcing Information

Human Capital Metrics

- Quality of K-12: Standardized Test Scores

National Assessment of Educational Progress (NAEP)

The National Center for Education Statistics (NCES) maintains records on math, science, and reading achievement tests conducted for the NAEP. Data can be sorted by state and is provided for several different grade levels. Data on reading and math test scores for fourth and eighth graders is a useful starting point for analysis. Because all tests are not given each year, it makes sense to only use figures for years in which both tests are available for both grades. To provide a point of comparison, benchmark the

local scores with the national average against a raw scale. The NCES data is available at http://nces.ed.gov/nationsreportcard.

Scholastic Achievement Test (SAT) and American College Test (ACT)

The SAT and the ACT measure student performance in various subjects, including science, math, reading comprehension, and writing. SAT and ACT scores are important criteria used for college admission decisions and are therefore key indicators of a school system's ability to prepare students for college entrance. Some state level data is available from organizations such as College Board (www.collegeboard.com) and ETS (www.ets.org). Users should search for regional data and, if available, use national and state averages for comparisons.

- Quality of K-12: Graduation Rates

Statewide graduation rates can be found on most state Department of Education websites. Most reports show the graduation rate by county, leaving the researcher the task of developing a weighted average, or showing the raw data for each district if seeking data on a particular MSA. Collecting data on each county, then comparing that data against national averages, will likely be the most straightforward way to present the information.

- Quality of Higher Education: Community Colleges

Data on community colleges is not as readily available as data on four-year colleges and major research universities. *Community College Week* (http://www.ccweek.com/Top100.asp) publishes some data on the number of certificates awarded at each school, but a source for national rankings of community and technical colleges could not be found for this guidebook. As a result, users should rely on the survey and interviews to assess the role of community colleges in a regional economy. Topics of interest during the interviews could include: the level and effectiveness of college collaboration with regional companies; responsiveness of course development to changing industry needs; and availability of internships.

- Quality of Higher Education: University and Four-year Colleges

Several media sources collect data on universities and colleges and compile rankings based on various specialties or characteristics. *U.S. News and World Report*, *Business Week*, *The Wall Street Journal*, and *The Financial Times* compile the most well-known rankings. The *U.S. News* rankings are perhaps the most widely followed, but most of the data must be purchased. Details are available on the *U.S. News* website (www.usnews.com). Also, university websites often have helpful information about rankings and other accolades. As most publications point out, rankings should never be the only source of information for rating the quality of an educational institution. Nevertheless, reputation is important because schools compete on an international

playing field for the most talented students. The business survey and interviews can also provide important context for data obtained from rankings.

- Quality of Higher Education: Endowment

An endowment generally refers to donations made to a university with the understanding that the principal amount of the donation will be invested with the earnings from that investment and used for the university's educational programs.[1] Endowments allow universities to pursue new initiatives and improve the overall quality of education and are therefore an important source of data for analyzing regional institutions. Data on endowments can be found on the Chronicle of Higher Education website (http://chronicle.com). Another source is the National Association of College and University Business Officers (NACUBO) (http://www.nacubo.org). It is useful to show the rank of the college compared to peer institutions, such as other public universities of similar size. Many of these databases require purchasing a publication subscription.

- Educational Attainment

The U.S. Census Bureau reports educational attainment data in its *Summary File 3*. To build a regional education profile, users should show the percentage of the population having attained a high school diploma or higher and the percentage having attained a Bachelors degree or higher for the most recent years available. Regional data should be benchmarked against state and national data for comparison. The easiest way to navigate the Census website is to use the American FactFinder tool (http://factfinder.census.gov). Data can be searched by region in "Data Sets" and then "Detailed Tables".

Data on Ph.D. graduates is available on the National Science Foundation (NSF) website (http://caspar.nsf.gov). Use the WebCASPAR search engine to access the "Earned Degrees by Race & Ethnicity" file and compile data for all races**.** Data can only be filtered by state or geographic region (e.g., Northeast), which limits its value for regional analysis.

- Labor Force: Managers, Engineers, Scientists, and Technicians

The U.S. Bureau of Labor Statistics (BLS) collects employment and occupational data in its annual Occupational Employment Statistics (OES) survey (www.bls.gov). The OES surveys approximately 400,000 establishments every year. Data collected after 1999 provides the most consistency, because the BLS occupational classification system changed that year. Users should collect data on four main occupational categories: Management (11-000), Architecture and Engineering (17-000), Computer and Mathematical (17-3022), and Life, Physical, and Social Science (19-000). The numbers in parentheses mark starting points for the occupational categories in the BLS Standard Occupational Code (SOC) system. Data can also be found for specific types of

[1] A useful explanation of endowments is found on the University of Alberta's website at www.financial.ualberta.ca.

technicians, such as civil engineering technicians and chemical technicians. Users should provide comparisons to the region's state and the nation.

In addition to the external data sources, we recommend a number of survey questions on human capital to supplement the assessment of the local workforce and educational institutions. (See survey in Appendix E) In the asset section of the survey, the following factors are included:

- Overall quality of the region's community and technical colleges
- Overall quality of the region's four-year colleges and universities
- Availability in the region of workers with the skills required by regional businesses
- Availability in the region of scientists and engineers with the qualifications required by regional businesses
- Availability in the region of information technology professionals with the qualifications required by regional businesses

Research and Development Metrics

- R&D Spending at Universities

The NSF's WebCASPAR database contains time series data for federal, state, and industry financed R&D spending at colleges and universities. Users can find the total R&D spending at universities in the region and then compare it on a per capita basis to the state and the nation. The WebCASPAR database can be found at http://caspar.nsf.gov.

Because many companies are privately held, comprehensive data on R&D spending at local companies is unavailable in a national database or standard business publication. Information on individual companies in a region, collected in a survey or study, may be available through a chamber of commerce or trade group, but most users will have to obtain that information through interviews with business leaders. Information on public companies is more readily available through required corporate filings.

Financial Capital Metrics

- Venture Capital Investment

Venture capital data is collected in a collaborative project by PricewaterhouseCoopers, Thomson Financial Venture Economics, and the National Venture Capital Association. The PWC/Venture Economics/NVCA Moneytree Survey is available on the Venture Economics website (www.ventureeconomics.com/vec/statshome.htm). Quarterly data is available by state, region, metropolitan area, and U.S. congressional district. Users can compile the data by congressional district and aggregate for the region. A useful way to

show the data is to normalize per 1,000 workers and compare the regions to peer regions, the state, or the nation.

- Number of VC Firms and Angel Groups

It is equally important to collect information on venture capital firms and angel networks in the region. High net-worth individuals and VC firms tend to invest resources locally and thus are key assets for ensuring entrepreneurs have access to capital. The local *Business Journal* is a good starting point for finding lists of local VC firms and angel groups as well as funds under management. One company, American Business Journals, Inc. (www.bizjournals.com) publishes many of the regional business journals in the United States.

Financial capital survey questions include:

- Availability in the region of risk capital from venture capital firms
- Availability in the region of risk capital from "angel" investors
- Availability in the region of capital from banks

Industrial Base Metrics

- Specialization by Traded Cluster

The Cluster Mapping Project at the Institute for Strategy and Competitiveness uses county-level data and statistical techniques to identify clusters in regional economies. Professor Michael E. Porter, the leader of the project, defines clusters as geographically concentrated groups of interconnected companies, universities, and related institutions that arise out of linkages across industries. Data is available at the state, economic area, metropolitan area, and inner-city levels. Clusters fall into three categories: traded, local, and natural endowment dependent. Regional wealth is driven by the performance of industries that export goods and services outside of the region, and therefore the traded clusters are of greatest interest to the innovation-based model. The Cluster Mapping Project website (http://data.isc.hbs.edu/isc/index.jsp) is a subscription service, but some data is available free of charge.

- Patents in Traded Clusters

The Cluster Mapping Project also offers time-series data on patenting within traded clusters, which is useful for tracking the rate of regional innovation over time. With innovation driving regional competitiveness, traded clusters with sustained growth in patents may be the best targets for economic development initiatives.

Physical Infrastructure Metrics

- Transportation Infrastructure

The most widely cited source for commuting data is the Texas Transportation Institute's (TTI) annual Urban Mobility Study (http://mobility.tamu.edu/ums/congestion_data). The report compares commute times for most metro areas in the nation. Arbitron Inc. (www.arbitron.com/outdoor_companies/travel.asp) has also reviewed and compared Census 1990 and 2000 data on commuting time to work in the U.S.

- Communications Infrastructure

The Progressive Policy Institute maintains an index of states' achievements in a variety of "new economy" areas. Online population, for example, is a basic measure for assessing the quality of a region's communications network as well as the connectivity of its residents. Showing a single state's adoption rate alongside the highest and lowest ranking states, as well as the national average, allows users to see the data in context. The data can be found at www.neweconomyindex.org. Telecommunications providers that offer services in the region may also have useful data, such as user trends, costs, and expansion plans.

Survey questions:

- The overall quality of the region's transportation (e.g., roads, air transport, railroads and ports)
- The quality of the region's communications infrastructure (e.g., telephone, wireless, high-speed Internet access)

Legal and Regulatory Environment Metrics

- Tax Burdens

Tax codes vary significantly across municipalities in a region. As a result, local sources are usually best suited for explaining a region's efforts toward making its tax code supportive to business. Several sources are available for comparing tax rate data at the national level. Economy.com offers several fee-based sources for information on business costs that include state and local tax data, such as its annual *North American Business Cost Review*. Reports can be found on the Economy.com website (www.economy.com). The Tax Foundation (www.taxfoundation.org) is another source for information on state tax and regulation systems. Its annual *State Business Tax Climate Index* provides data on individual income tax, fiscal balance, tax base conformity, sales and gross receipts tax, and corporate income tax. Data should be presented in a way that illustrates comparisons among peer regions, according to location, population, or some other criterion.

- Cost of Doing Business

Cost-of-doing-business data can be found in publicly available and private sources. Several magazines, such as *Forbes*, publish annual rankings that compare metropolitan areas based on various cost-of-doing-business indicators (www.forbes.com/lists). Several private economic consulting firms such as Economy.com (www.economy.com) also offer cost-of-doing-business data. Economy.com's *Precis Metro Reports*, for example, include a yearly measure of the cost of doing business at the MSA and state levels. The index weights factors such as tax burdens, labor costs, and energy costs.

Survey questions include:

- Cost of doing business in the surveyed firm's region (specifically, the cost of real estate, wages and salaries, and utilities)
- Region's cost of living for the surveyed firm's employees
- State and local governmental regulations and permitting procedures affecting businesses
- Level of taxation affecting business (relative to other regions)

Quality of Life Metrics

- Inflow/Outflow of Residents

Economy.com's *Precis Metro Reports* include an annual measure of resident inflows and outflows at the MSA, state, and national levels based on tax filing data from the Internal Revenue Service (IRS). The data shows a household's current county of residence, as well as the county to which a household may be moving, the number of household members, and household income. Economy.com aggregates this data by metro area into gross migration. IRS data only covers those families that file tax returns, so Economy.com also uses data from the U.S. Census Bureau, which covers all migrants, including international migration. The reports are available for purchase on the Economy.com website (www.economy.com).

- Cost of Living

Several sources are available for obtaining cost-of-living data. Economy.com's *Precis Metro Reports* include an annual index of costs of living by MSA. Their index measures the relative cost to the average household in the nation to maintain its standard of living. The index is created by summing expenditures on various components of consumption in each metro area relative to average U.S. expenditures on the components. The components that vary across metro areas include housing, food and apparel, utilities, transportation, and auto insurance. Another source of data is the American Chamber of Commerce Researchers Association (ACCRA), which publishes its Cost of Living Index

publication on a quarterly basis. The ACCRA index can be found at www.coli.org. Both sources are available for purchase only.

Survey questions:

- The region's cost of living for your employees
- The region's overall quality of life (e.g., climate, cultural, and recreational opportunities)

Culture Metrics

Section III of the regional business survey, Regional Norms and Attitudes, deals with the cultural aspects of a region and how they can help or hinder innovation. The questions are divided into three main themes that area related to supporting an innovative environment:

- Appreciation for diverse views and backgrounds
- Willingness to collaborate
- Understanding and appreciation for the entrepreneurial process

Rather than ask questions that directly address how a person thinks, respondents are asked to share their "level of agreement" with a number of relevant descriptive statements about the region. This method is utilized to minimize the false answers that may be offered when respondents believe there is a "right" answer to a question. (For example, few people would disclose personal racial biases, but would answer forthright that racism exists in the community)

Output Metrics

Innovation

Innovation is the foundation of a region's capacity for achieving sustainable growth through the creation and application of new ideas. The innovation process, though not linear, can be usefully divided into three phases: Idea Generation, Idea Development, and Commercialization.

Idea Generation

Wealth creation starts with an idea, whether it is formed in a state-of-the-art research facility or in a neighbor's garage. A region will sink or swim based on its ability to capture and develop the innovative ideas of its residents and industries.

Idea Development

The second step in the innovation process is idea development. Ideas can be generated in virtually any setting, but the development and testing required to turn an idea into a new product or service require structure and resources. Software, for example, can be tested relatively cheaply and quickly with enough willing users and available equipment. In other fields, such as life sciences, the process is much longer and requires considerable investment to get products to market. Pharmaceutical companies take over a decade to develop a new drug before it reaches the market. Partnerships between industries and universities can accelerate the product life cycle and should be evaluated when analyzing this stage of the innovation process.

Commercialization

For tested ideas to benefit a region in terms of economic development, they must be translated into new products and services through the commercialization process. Economic developers can nurture commercialization in a region by using strategies that create strong networks between researchers and companies, and by supporting innovation within existing firms. Examples include: business incubators; industry association sponsorships of research groups at universities; or even setting up networking events where university representatives and companies can exchange ideas and share news about local R&D projects.

Measuring the three phases of innovation is not a simple task. More metrics exist for the earlier stage of the process. Patent data is relatively easy to obtain, however data about new products or services being tested or sold is much more difficult to gather, particularly when the innovation is being undertaken by private firms that need not publicly report financials. Still, it is possible to at least indirectly measure the aspects of the entire innovation "pipeline."

Idea Generation Metrics

- Patents

  The United States Patent and Trademark Office (USPTO) offers a searchable database by state and city of issued patents on its website (http://patft.uspto.gov). Collecting information on the number of patents issued in a MSA is complicated, because the user cannot sort patents by MSA. If the MSA is of a manageable size, data can be collected by city, and the user can do multiple searches and aggregate the data to the MSA level. Collecting data at the MSA and national levels, and normalizing the data per employee with employment data from the Bureau of Labor Statistics, is a useful way for presenting the data in context.

  To measure the impact (or quality) of patents, it is also possible to track the number of regional patent citations in scientific literature. However, there is no simple way to accomplish this for each patent associated with a particular region.

Not all viable ideas for new products and services reach the patent stage. For a more complete picture of a region's ability to produce new ideas, economic developers should supplement the national patenting data with region-specific research, such as surveys and interviews.

Idea Development Metrics

- University Tech Transfer Scorecard

The Chronicle of Higher Education's *University Tech Transfer Scorecard* provides a series of metrics which rank University success in commercialization. The Scorecard is constructed with data from the five most recent surveys of the Association of University Technical Managers (www.autm.net) and contains scores for only those schools that reported in four of the last five years. The Chronicle presently ranks respondents among the 117 reporting universities. Indicators offered in the report include: number of start-up companies formed per $10 million spending on research; licensing income per dollar of research spending; and number of inventions disclosed per $1 million spending on research, among others. The latest report can be found at http://chronicle.com/stats/techtransfer.

- New Firm Starts

The number of new firms started in a given year is a useful proxy for assessing idea development and testing. Entrepreneurs need to raise money to move an idea to market, and that usually requires starting a business. Data on new firm starts can be found at the U.S. Small Business Administration's Office of Advocacy website (www.sba.gov/advo/research). Data is available at the national, state, and MSA levels. Users may also want to purchase data from business intelligence firms such as Dun & Bradstreet, Hoover's, and InfoUSA. Data from those firms is primarily used for marketing purposes, but is helpful if users are interested in specific information such as company names, addresses, and revenues.

- Small Business Innovation Research Grants

The U.S. Government issues Small Business Innovation Research (SBIR) grants to small companies to encourage development of new technologies. The Office of Technology of the Small Business Administration maintains information on SBIR grants. Data is available for number and value of awards at the state level. Phase I and II awards can be aggregated for easier comparisons. The SBA website also publishes locations for grant recipients, which can be aggregated for looking at MSAs. However, 1998 is the latest year available, and the SBA no longer updates the information on its website. Users should contact their local SBA offices for updated data on grant recipients. Local offices can be found using the map on the SBA website (www.sba.gov). SBIR data can be normalized per 10,000 employees for comparison to other regions. Data can be found at www.sba.gov/sbir/indexsbir-sttr.html.

- Small Business Technology Transfer (STTR) grants

The U.S. Government also issues STTR grants to cooperative research projects involving a small business and a research institution, such as a university or a non-profit research group. STTR grants were developed as a vehicle for moving ideas from research institutions to market. Data availability is similar to SBIR grant data, and can be found on the same page of the SBA website (www.sba.gov/sbir/indexsbir-sttr.html).

Commercialization Metrics

Most data on commercialization needs to be collected from regional sources, such as trade publications or business journals. Users can also conduct surveys and interviews at local companies to develop a system for benchmarking commercialization in the region. One way to indirectly measure commercialization is to collect data on business growth. Dynamic growth rates usually result from key innovations in products or services.

- Gazelles

Economic developers use the term "gazelle" to describe a company with annual sales revenue that has grown 20 percent or more as a share of total employment for at least four years. The number of gazelle companies in a region is indicative of an environment that supports rapid company growth. Sales data is available from business intelligence companies such as Dun & Bradstreet, Hoover's, and InfoUSA. The Progressive Policy Institute publishes rankings of states according to their number of gazelles. The rankings, based on data from Cognetics, are available from the PPI's *New Economic Index* (http://www.neweconomyindex.org/states/2002/03_dynamism_02.html).

- *Inc. 500*

Inc magazine's annual *Inc.500* list (www.inc.com/inc500) shows the fastest growing privately held companies in the U.S. The data is searchable by state, and users can then scroll through the list and identify companies in cities of interest. *Inc* contacts more than 500,000 firms to compile the list, and data is currently available from 1988-2004. Access to the full database requires purchasing a subscription. Users should consult the magazine's list methodology before comparing data from multiple years.

Productivity Metrics

- Gross Regional Product (GRP) per Employee

GRP is defined as the total value of all goods and services produced in a given region. Unlike national income accounting, output at the regional level is difficult to measure and therefore not readily available in public databases. Economy.com and other economic consulting firms make estimations of regional output using various statistical techniques. Data is available for MSAs and counties, and can be purchased on Economy.com's website.

Prosperity Metrics

Real measures of financial success exist and include indicators such as poverty, per capita income, and unemployment. However, to capture the fuller meaning of prosperity, it is also critical to gauge residents' self-assessment of quality of life using surveys or interviews.

- Job Growth

Job growth can be calculated using the Current Employment Statistics (CES) data set from the Bureau of Labor Statistics. The BLS compiles the data monthly from payroll records at more than 390,000 businesses in the nation. Data is available on employment, hours, and earnings of workers on non-farm payrolls for all 50 states and over 270 metropolitan areas. Job growth is calculated as the percentage growth of the labor force from the previous year. The data can be presented showing year over year labor force growth for the MSA, state, and the U.S. for comparison. The data can be found on the BLS website (www.bls.gov/sae).

- Unemployment Rate

The unemployment rate is defined as the percentage of the population actively seeking employment that is not currently employed. The BLS publishes unemployment rates in the Local Area Unemployment Statistics (LAUS) section of its website (www.bls.gov/lau). LAUS produces monthly and annual employment, unemployment, and labor force data for Census regions and divisions, states, counties, metropolitan areas, and many cities, by place of residence. For regional analysis, time-series data can be collected at the MSA, state, and national levels for benchmarking purposes.

- Average Wage

Regional wage data is available from two national sources: the BLS and the Bureau of Economic Analysis (BEA) Regional Economic Accounts database. The BLS publishes wage data by state, MSA, and county in its Quarterly Census of Employment and Wages. Users can download various data (e.g., average weekly wage and average annual pay) and search by NAICS industry and size of establishment. The BLS data is located at www.bls.gov/cew. The BEA publishes average wage per job data for states, MSAs, and counties from 1969 to 2003. The BEA data is found at www.bea.doc.gov/bea/regional/reis.

- Per Capita Income

Per capita income is perhaps the most widely-cited statistic for assessing standard of living. The BEA provides detailed income data in the Regional Economic Accounts database. Per capita income and other income measures are available at the state, MSA, and county levels. Calculating compound annual growth rates (CAGR) for the last three decades and showing data for the region or MSA, state, and the nation provides useful context for the data. The BEA data is located at www.bea.doc.gov/bea/regional/reis.

- Median Household Income

Median household income is another useful measure, because it minimizes the effect of the very high-income families in a region and therefore provides a more accurate picture of the "average" household's standard of living. Median household income data can be found in the decennial Census from *Summary File 2*. Data can be collected for either the MSA, or if unavailable, compiled from each county and weighted by population. *Summary File 2* data can be accessed through the Census American FactFinder website (http://factfinder.census.gov). More recent estimates of income for states and most metro areas are available in the annual American Community Survey, also available on the FactFinder page.

- Income Growth by Ethnicity

Inequality is a weakness that undermines regional economic performance. For example, disparity in income data according to race or gender can signal underlying social problems that limit the productivity potential of a region's entire workforce. Data on income growth by ethnicity is collected in the decennial Census and published in *Summary File 2*. Data can be collected for either the MSA, or if unavailable, compiled from each county and weighted by population. Formatting the data in terms of minority percentage of white, per-capita income is a straightforward way to assess inequalities in the regional economy.

Appendix B – Example Asset Mapping Charts

Incorporating the data elements and evaluation metrics described above, an example set of charts for the human capital section of a regional asset map has been developed. It is available on the WIRED Collaborative website at:

http://wired01.asurite.ad.asu.edu/default.aspx

(Click on the Asset Mapping Folder in Shared Documents)

Appendix C: Additional Asset Mapping Examples

The WIRED Collaborative web site is home to numerous examples of asset maps developed by other organizations, using distinct methodologies. The maps available include:

- **Washington State Innovation Index**
  http://www.watechcenter.org/downloads/index_final.pdf
  Example of a comprehensive asset mapping effort.

- **Halifax-Moncton Growth Corridor Asset Mapping**
  http://www.greaterhalifax.com/site-ghp/media/Parent/HMGC_Executive_Summary.pdf#search=%22Halifax%20Moncton%2
  Example of a narrative summary of an economic asset mapping project.

- **CAEL Workforce Development and Educational System Asset Map Examples from Kentucky**
  Examples of workforce/talent development focused maps, with significant detail and focus on policy framework.

These examples and others can be obtained at:

http://wired01.asurite.ad.asu.edu/default.aspx

(Click on the Asset Mapping Folder in Shared Documents)

APPENDIX D: Workforce & Innovation Technical Solution (WITS) for WIRED Overview

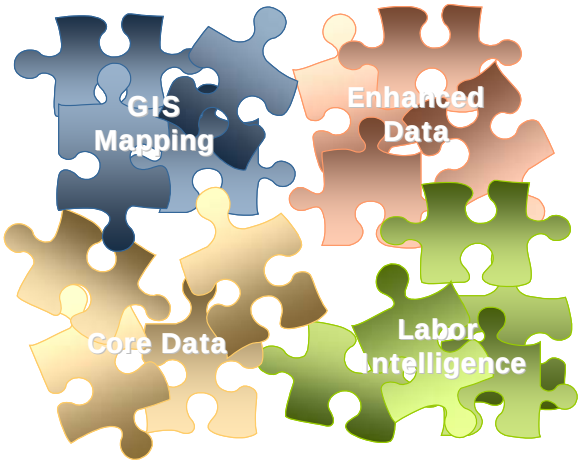
The Employment Training Administration (ETA) has contracted with New Economy Strategies to provide a data resource tool called Workforce & Innovation Technical Solution (WITS) for supporting and enhancing their Workforce Innovation in Regional Economic Development (WIRED) initiative. WITS is a web-based software solution that combines core and enhanced datasets with Geographic Information Systems (GIS) mapping and labor intelligence. WITS provides advanced technical capabilities in a powerful tool to aid in economic development and workforce-related decisions. ETA has licensed WITS and is providing the WIRED regions with access to its underlying data and the necessary training to use the tool with relevant case studies and practices.

WITS Product Description

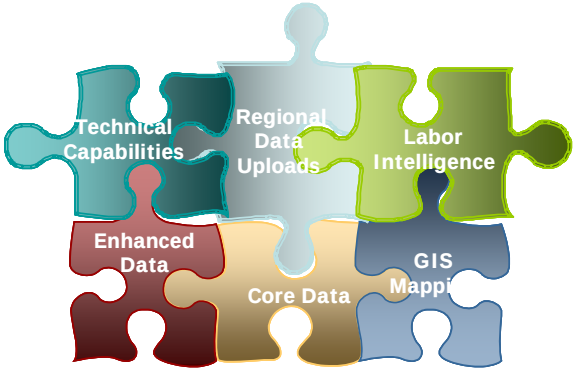
WITS incorporates access to a wide range of data as well as extensive reporting and analysis tools containing the following functionality:

- **Core Data:** Demographics; household and income data; population and ethnicity data; educational attainment; business location data; business summary by NAICS, and more.
- **Enhanced Data:** industry cluster analysis; real-time labor intelligence coupled with historical trends in job searches; occupational analysis; federal research and development funding; Patent analysis; venture capital data; asset and program inventory.
- **Regional Data Uploads:** Upload of contributory data on regional innovation activities and assets using agreed upon format; specific cluster information not found in the core and enhanced datasets.

Current Data Scenario



- **Labor Market Intelligence:** Data on current/historical job postings and searches; Statewide Labor Market Information data; ONET links, and wage and payroll data



WITS Toolkit

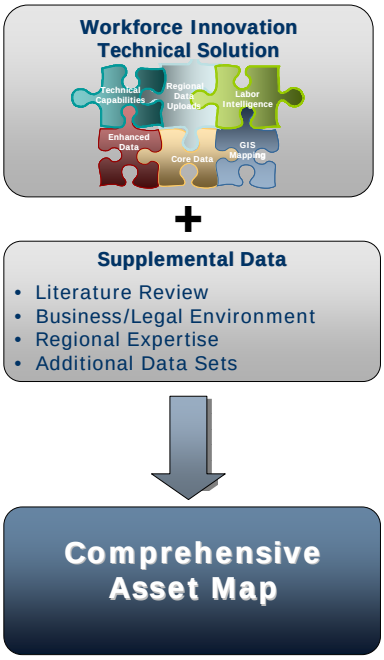
- **GIS Mapping:** Thematic GIS mapping; live layer mapping; map export options; user map customization; aerial photo coverage.
- **Technical Capabilities:** Instant summarization of multiple geographies; user-defined location data; user-defined geographies; geography benchmarking/ranking; map annotations; and more.

General Asset Mapping Components

Mapping assets within a region requires the collection of both quantitative and qualitative data from a variety of sources. The purpose of an asset map is to inventory relevant resources, while simultaneously gaining a deeper understanding of a region's unique attributes, potential opportunities and significant weaknesses. Major categories of data included in a comprehensive regional asset map are listed below with key WITS data sets (version 2.0) in **bold**.

Asset Class	Description	Areas for Evaluating Asset Class Strength
Human Capital	Human capital is the skill sets and abilities of the local population, which represent a major input to economic growth. The strength of a region's human capital base is determined in large part by its workforce, education, employment, and income levels.	• **K-12 Schools** • Community Colleges, Technical Schools, 4-Year Colleges and Universities • Educational Attainment • **Worker Productivity** • Occupational Data Analysis • Workforce and Training Programs • Unemployment Rate • Wage Data • Payroll by Cluster • Demographics
Research & Development Activity	A region's Research and Development portfolio represents the next generation of products, processes, services, and new business growth. This is effectively tracked through federal and private R&D, patents, SBIR grants, and university spending and technology transfer activities.	• **University Spending and Tech Transfer Activity** • Federal R&D Expenditures • Private R&D • Patents Data • Small Business Innovation Research Grants • **Technology Transfer grants**
Financial Capital	Financial capital fuels an innovative and entrepreneurial economy by providing the funds necessary to translate new technology and ideas into business ventures. The capital can come from many sources, including venture, angel, philanthropy, traditional bank lending and small business loans.	• Venture Capital Investment • **Information about angel, venture capital, and philanthropic networks and institutions** • **Public filings with government agencies** • **Small Business Administration loans**
Industrial Base	Every region has a unique composition of industries that if leveraged becomes their competitive advantage. Mapping these industries allows the region to identify and assess emerging, established and declining economic opportunities.	• Cluster Mapping • Industry Analysis • Business Location Mapping
Physical Infrastructure	The availability and quality of highways, railroads, waterways, airports, telecommunications, energy, and other types of physical infrastructure are factors that influence the location of people and economic development investments.	• **Commuting Patterns** • Transportation Network Mapping • Business Incubators, Research Parks, Federal Laboratories, DoD Bases
Governmental Support, Legal Environment, and the Quality of Life	**Cultural venues, outdoor recreation, affordable housing, tax policy, and business regulatory permitting processes, influence a region's economic environment.**	• **Residential Flows; Cost of Living** • **Government programs and initiatives** • **Tax laws and business operation costs** • Workforce Development Programs

WITS: Asset Mapping Capabilities



The WITS Toolkit is designed to efficiently evaluate the strength of an asset class using select quantitative information. WITS can aggregate cumbersome, but important quantitative data, into an easy-to-use reporting format. WITS takes select data sets and quickly translates them to graphs, charts and tables to use for analysis, publications and presentations. Additionally, it converts hard data into GIS maps within and across several geographies, allowing users to quickly and easily visualize the data. Incorporating key datasets – from concrete population statistics to abstract quality of life measurements – allows a region to begin identifying potential gaps and weaknesses as well as opportunities and strengths.

Supplemental Data

While WITS contains a number of critical data sets, there are various qualitative and additional measures for evaluating a region that are required to complete a comprehensive asset map. Examples of supplemental data include:

- Literature Review – Catalog five to seven years worth of the region's previous economic studies and recommendations to note prior work and historical perspective on asset inventories.
- Business and Legal Environment – Conduct an assessment or survey of the regional attitudes related to the business and innovation environment, entrepreneurial culture and quality of life.
- Regional Expertise – Input from civic, business, academic leaders, and investors that represent every regional organization, institution, and company that builds, contributes to, and/or uses regional assets to capture current and future utilization, related challenges and barriers, and demands for increased asset creation and investment.
- Additional Data Sets – Key data sets such as K-12 school and financial capital institutions, among others, can be uploaded into WITS by individual users to make it a more comprehensive and robust tool.

WITS Case Study

Objective: **Stimulate job creation by preparing the workforce for future trends and requirements.**

Approach:

- **Analyze federal and private sector funding of R&D.**
- **Determine intellectual property activity and investment trends.**
- **Track economic and employment trends within key competitive industries.**
- **Identify current and anticipated workforce development gaps.**

Outcome: **Create workforce and training programs to develop specific skills sets in support of emerging industries.**

In conclusion, this powerful tool has the capability to analyze economic strengths and weaknesses of a region by reviewing industry, intellectual property, workforce, and research & development data to formulate SWOT, gap and other analyses. WITS can filter and customize information into clear, concise reports that allows users to gain the knowledge around assets that drive planning, policy-making, action, implementation, and investment decisions within a region. WITS users will spend less time and resources collecting key quantitative data and more time efficiently and effectively analyzing results to assist with resource allocation, promote regional stewardship, and focus investment and policy related decisions.

APPENDIX E -- Example Regional Business Survey

I. Business Environment

In this section, we are interested in learning about how each of the following factors affects your business. Please rate the region's current performance (level) on each factor

(check one box in each row)

Section 1	very harmful to your business	harmful to your business	neither harmful nor beneficial to your business	beneficial to your business	very beneficial to your business	not applicable (N/A)
1. The overall quality of the region's transportation (e.g., roads, air transport, railroads, and ports)	☐	☐	☐	☐	☐	☐
2. The quality of the region's communications infrastructure (e.g., wireless, and high-speed internet)	☐	☐	☐	☐	☐	☐
3. The cost of doing business in your region (specifically, the cost of real estate, wages and salaries, and utilities)	☐	☐	☐	☐	☐	☐
4. The region's cost of living for your employees	☐	☐	☐	☐	☐	☐
5. The region's overall quality of life (e.g., climate, cultural, and recreational opportunities)	☐	☐	☐	☐	☐	☐
6. The overall quality of the region's community and technical colleges	☐	☐	☐	☐	☐	☐
7. The overall quality of the region's four year colleges and	☐	☐	☐	☐	☐	☐

universities		

(check one box in each row)

Section 1, cont.	very harmful to your business	harmful to your business	neither harmful nor beneficial to your business	beneficial to your business	very beneficial to your business	not applicable (N/A)
8. The availability of regional college and university apprenticeship/ internship programs	☐	☐	☐	☐	☐	☐
9. The quality of technical assistance offered by regional colleges and universities to businesses	☐	☐	☐	☐	☐	☐
10. The quality of R&D collaboration between businesses and regional college/university researchers	☐	☐	☐	☐	☐	☐
11. The availability in the region of workers with the skills your business requires	☐	☐	☐	☐	☐	☐
12. The availability in the region of top managers with the qualifications your business requires	☐	☐	☐	☐	☐	☐
13. The availability in the region of scientists and engineers with the qualifications your business requires	☐	☐	☐	☐	☐	☐

(check one box in each row)

Section 1, cont.	very harmful to your business	harmful to your business	neither harmful nor beneficial to your business	beneficial to your business	very beneficial to your business	not applicable (N/A)
14. The availability in the region of information technology professionals with the qualifications your business requires	☐	☐	☐	☐	☐	☐
15. The availability in the region of risk capital from venture capital firms	☐	☐	☐	☐	☐	☐
16. The availability in the region of risk capital from "angel" investors	☐	☐	☐	☐	☐	☐
17. The availability in the region of capital from banks	☐	☐	☐	☐	☐	☐
18. The availability in the region of specialized facilities and laboratories for product testing and development	☐	☐	☐	☐	☐	☐
19. The quality of the region's specialized suppliers for your business	☐	☐	☐	☐	☐	☐
20. The regional availability of demanding customers for your business	☐	☐	☐	☐	☐	☐

(check one box in each row)

Section 1, cont.	very harmful to your business	harmful to your business	neither harmful nor beneficial to your business	beneficial to your business	very beneficial to your business	not applicable (N/A)
21. The effectiveness of the region's university technology transfer offices	☐	☐	☐	☐	☐	☐
22. State and local governmental regulations and permitting procedures affecting businesses	☐	☐	☐	☐	☐	☐
23. The level of taxation affecting business (relative to other regions)	☐	☐	☐	☐	☐	☐
24. The effectiveness of government-sponsored growth incentives (tax breaks, seed funding, etc.)	☐	☐	☐	☐	☐	☐
25. The quality of promotional and marketing campaigns featuring the region	☐	☐	☐	☐	☐	☐
26. The effectiveness of regional programs to help start-up businesses	☐	☐	☐	☐	☐	☐
27. The effectiveness of regional programs to train entrepreneurs	☐	☐	☐	☐	☐	☐

Summary

28. Considering all the factors presented so far, how would you currently rate your region overall as a place for your business to succeed?

- ☐ Poor location
- ☐ Fair location
- ☐ Good location
- ☐ Very good location
- ☐ Excellent location

29. In five years, do you believe the quality of your region as a place for your business to succeed will decline, stay the same, or improve?

- ☐ Decline
- ☐ Stay the same
- ☐ Improve

30. Specifically with regard to state and local ***government programs and policies,*** please list and explain the most critical issues that should be addressed to improve your business's prospects for success.

31. Specifically with regard to ***regional universities and community and technical colleges***, please list and explain the most critical issues that should be addressed to improve your business's prospects for success.

II. Innovation Networks

In this section, we are interested in understanding how your relationships with other regional institutions help your business to **innovate.**

Innovation includes developing and commercializing new products, as well making improvements to existing products, services, or business processes.

Overall, how valuable is interaction with each of the following regional institutions to your businesses capacity to innovate?

REGIONAL INSTITUTIONS
(check one box in each row)

	Not at all valuable	Somewhat valuable	Valuable	Quite valuable	Extremely valuable	Not applicable (N/A)
32. Universities and 4-Year Colleges	☐	☐	☐	☐	☐	☐
33. Community/ Technical Colleges	☐	☐	☐	☐	☐	☐
34. Public or Private Research Organizations	☐	☐	☐	☐	☐	☐
35. Professional Service Firms	☐	☐	☐	☐	☐	☐
36. Federal Labs	☐	☐	☐	☐	☐	☐
37. Regional Customers	☐	☐	☐	☐	☐	☐
38. Other Businesses in your Industry	☐	☐	☐	☐	☐	☐
39. Regional Suppliers	☐	☐	☐	☐	☐	☐
40. Banks	☐	☐	☐	☐	☐	☐
41. Venture Capital Firms	☐	☐	☐	☐	☐	☐
42. Angel Investors	☐	☐	☐	☐	☐	☐
43. Business Incubators	☐	☐	☐	☐	☐	☐
44. Industry or Cluster Associations	☐	☐	☐	☐	☐	☐
45. Non-professional Associations (alumni clubs, athletic clubs, etc)	☐	☐	☐	☐	☐	☐
46. Entrepreneurial Networks	☐	☐	☐	☐	☐	☐

47. Business Assistance Centers	☐	☐	☐	☐	☐	☐

48. Please list, by name, the most valuable institutions to your business's innovation.

III. Regional Norms and Attitudes

In this section, we are interested in learning about the dynamics of the business and civic environment of your region.

(check one box in each row)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
49. New residents can easily integrate into the regional business community	☐	☐	☐	☐	☐
50. The region is a welcoming, tolerant, and attractive place for people of diverse backgrounds	☐	☐	☐	☐	☐
51. Leaders in the region are responsive to the needs of all the regional residents, irrespective of ethnicity, cultural heritage, gender, or lifestyle	☐	☐	☐	☐	☐
52. The business culture in the region understands failure as part of the learning and innovation process	☐	☐	☐	☐	☐
53. People from different industry and economic sectors frequently interact in the region (e.g., bankers and engineers, manufacturers and tourism providers)	☐	☐	☐	☐	☐
54. The region celebrates the growth of companies, not just the absolute size of companies	☐	☐	☐	☐	☐
55. Artists and business-people frequently interact in the region	☐	☐	☐	☐	☐
56. Local government institutions eagerly partner with the private sector to promote new business development	☐	☐	☐	☐	☐
57. Business leaders in the region treat entrepreneurs, start-ups, and new companies as full partners in all aspects of industry cooperation	☐	☐	☐	☐	☐
58. Business leaders proactively share information and resources when possible	☐	☐	☐	☐	☐
59. Regional residents actively participate in community development organizations and projects	☐	☐	☐	☐	☐
60. Successful business people in the region actively invest in economic development projects and start-up ventures	☐	☐	☐	☐	☐

61. Considering your entire regional business environment, please list and explain the ***most important regional issue or issues*** that should be addressed to improve your business's prospects for success.

IV. Demographics

Please complete this brief background section. Please keep in mind that the information you supply about yourself and your organization will remain anonymous, and will be analyzed only in combination with other responses.

	(Check one)
62. What percentage of your company's sales is to customers within the region?	□ 100% • □ 75-99% □ 50-74% □ 10-49% □ less than 10% □ don't know
63. Where is your business headquartered?	□ in the region □ elsewhere in the US □ outside the US
64. Does your company sell (export) products or services outside the US?	□ yes □ no □ don't know
65. Which best describes the primary industry focus of your company? (If your company is involved with more than one focus, check the one that creates the majority of its revenues.)	□ Aerospace □ Manufacturing □ Finance / Accounting □ Insurance / Real Estate / Legal □ Medical / Dental / Health □ Telecommunications Services □ Transportation / Utilities □ Construction / Architecture / Engineering □ Data Processing Services

	□ Wholesale / Resale / Distribution □ Education □ Marketing / Advertising / Entertainment □ Research / Development Lab □ Business Service / Consultant □ Computer / Network Consultant □ Hospitality / Tourism □ Food Services □ Agriculture □ Other _____
66. What year was your business founded?	
67. What year did your business first establish a presence in this region?	
68. Approximate number of people employed by your business **in the region**.	In 12/1999 _____ In 12/2001 _____ Current (2003) _____
69. 2002 Gross Revenues (approx.)	□ <$1 million □ $51-100 million □ $1-10 million □ $101-300 million □ $11-50 million □ $301-500 million □ $500 million □ Don't know
70. Please estimate your company's average annual revenue growth over the past three years.	□ Negative □ 11 to 20% □ 0% □ 20 to 100% □ 1 to 5% □ Over 100% □ 6 to 10% □ Don't know
71. Which best describes your position in your company?	□ Owner / President / CEO □ Senior Executive or Senior Official □ Director / Vice President □ Manager □ Other _____
72. How long have you lived in the region?	□ less than 2 years □ 2 to 5 years □ 5 to 15 years □ 15+ years
73. If willing to be contacted about your views, please provide:	***Name:*** ***Phone:*** *Email:* *Mailing Address:*

This concludes the regional opinion survey.
Thank you for your cooperation.

APPENDIX F – Example Community Leadership Interview Template

I. Interview Background and Preparation

Interview Focus:

- To develop a deeper understanding about the forces/institutions that helped and hindered the region in reaching its present state of development
- To assess how alliances and networks support and promote regional innovation
- To explore and confirm survey results, regarding regional and cluster priorities for action

Target Audience:

- University/research and development community
- Selected industry cluster leaders (balance of new and established companies)
- Venture capitalists/financiers
- Business service provider/advisors
- Business associations and economic development organizations

Target Corporate Level:

Officers, senior management (special interest in Director of Research and Development, or person most involved with firm's innovation policy)

Target Number:

30 interviews (more acceptable)

Distribution:

Four- six interviews in each audience category/subcategory of individuals that have participated in and/or observed the evolution of the region's economy

Length of Interview:

Approximately one hour

II. Interview Introduction

The following section provides the interviewer a basic interview script that can be modified as necessary. Italicized sections represent interview cues and are not intended to be read aloud.

Thank you for agreeing to participate today. To begin, I would like to provide a concise statement of this project's purpose, as well as the focus of today's interview:

Statement of General Project Purpose:

- To assess the strengths and weaknesses of the regional innovation environment
- To develop insights and recommendations for how the region can improve conditions that support innovative firms and people.
- To catalyze action to improve the regional innovation environment

III. Interview Questions

This section asks respondents to provide regional performance data (potential indicators: new job growth, employment growth, income per capita growth, and cluster growth).

In answering the following question set, consider the economic indicators of your region's performance that we just discussed.

Regional Development

- How do you explain your region's relative economic performance compared to other regions?
- Do you think the region has been successful over time, and if so why?
- What, if any, are the catalytic events that led to its success?
- What are the major barriers to economic prosperity that have appeared (and been overcome) at critical junctures in the evolution of this region?
- Is there a regional consensus on development issues facing the region today?

Network Focus in Development

- What sort of networks or network organizations have helped the region develop?
- How have the networks helped (e.g., finance, workforce development, etc.)?
- How have the networks evolved over time to meet the needs of the community?
- Are there any networks that have been particularly important in attracting or nurturing innovative firms?
- How have they done this? How are they doing it today?

Priorities for Action (Confirmation/Deepening of Survey Results)

- Why is your firm located in this region?
- What barriers do you see to expansion in this region?
- According to our leadership survey, A, B, C are priorities for your industry cluster/region to continue to successfully innovate. Do you agree? Why or Why not? Give examples?

Innovation Specific Questions

We have spoken broadly about the development of the region. Now let's turn to specific aspects of innovation.

General Innovation Issues

- What are the major sources of new ideas and information for innovation (ideas with commercial potential) been in the region?
- Where/who did they come from?
- What environmental/cultural/business factors are important to, or have an impact on, innovation in your region? Has this changed from the past? Give examples.
- Some people argue that the interaction between firms in different industries is a major source of innovation (e.g., software and entertainment = game software). Is there much of this creative interaction between different firms in your region?

Private Sector Research and Development (R&D)

- Broadly speaking, how does your company foster innovation?
- What is your company's R&D policy? What is R&D as a percent of sales?
- Do you partner in R&D with other companies in your industry? Your suppliers?
- What mechanisms (formal & informal, network-related) help move research from the lab to prototyping and to business development?
- Are there mechanisms (organizations) that support quick diffusion of technical or market information to companies in your cluster?
- If yes, describe?

University R&D (to be asked of university respondents)

- How do the universities in this region interact with businesses? Has this relationship changed (improved) over the past years? Explain.
- Are research partnerships with businesses prevalent?
- Are the partnerships focused around basic research or technology commercialization?
- Do businesses frequently and clearly state their needs from the university partnership?

Business (to be asked of business respondents only)

- How does the University support your cluster?
- Are they valuable partners in your innovation processes? How?
  - Basic research partnerships?
  - Commercialization partnerships?
  - Providers of employees (faculty, researchers, graduates)?
- How has this changed over time?
- Has your company licensed technology from a university, private research institution, or federal lab?

- How aggressive are the universities in commercializing applied research (licensing, equity investor, incubators)?

Government (to be asked of government and business respondents)

- How effective is your state and local government in fostering the development of innovative firms?
- What policies directly impact your innovation process/results?
- Which policies have helped firms innovate?
- Which policies have hindered innovation?
- Does your state or local government work with the private sector to attract suppliers, manufacturers, and service providers related to your business? Provide examples.
- Does the state or local government sponsor or support forums to bring together government, industries, and universities? Provide examples.
- Are there any other important government or non-profit organizations that support business development?

New Business Formation (to be asked of all respondents)

- How does new business formation happen in your region? Is it predominately internal or do you attract most new companies from outside the region?
- Are the founders typically from the region or people who have moved to the area to start a business?
- Do networks play a role in business formation in your region? If so how?

New Venture Support (to be asked of business respondents and venture capitalists)

- Is there a strong group of local business support and strategic advising services for start-ups? How have they been helpful to you?
- What alliances or networks provide access to capital?
- How rapidly can new ventures or expansions be financed locally?

- Does the regional culture foster start-up ventures and entrepreneurship? If so, how?

- How does government in your area support the particular needs of start-up companies? (Incubators, financing, enterprise zones?)

Venture Capital (VC)/Financiers Sector

- What is your primary source of deal flow? (Is it network related?)

- How does the VC define its role in an investment relationship (e.g., develop team, strategic/expert advisor, connect firms to talent and technology-matchmaker)?

- Apart from actual deals, what are the most prominent ways you are connected to the business community?

Please have the respondent indicate yes or no to the following questions and then explain his or her answer:

- Do you have formal and/or informal relationships with other VCs?

- Do you have linkages with University R&D community? Points of connection? Incubators? Technology licensing offices? Are the relationships formal/informal?

- Do you have involvement in industry associations?

- Is there an "angel" community providing seed capital where traditional VC does not? Does your VC follow up as the project matures?